Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte CARL H. HUBERT

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Appeal No. 96-1999
Application 08/216,382[1]

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ON BRIEF

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Before COHEN, ABRAMS and McQUADE, Administrative Patent Judges.

COHEN, Administrative Patent Judge.

DECISION ON APPEAL

[1] Application for patent filed March 23, 1994.

This is an appeal from the final rejection of claims 1 through 8 and from the refusal of the examiner to allow claim 9,

as amended subsequent to the final rejection. These claims constitute all of the claims in the application.

Appellant's invention pertains to a spacecraft and to a method of imparting a velocity to a spacecraft. An understanding of the invention can be derived from a reading of exemplary claims 1 and 8, copies of which appear in the APPENDIX to the brief (Paper No. 10).

As evidence of anticipation, the examiner has applied the document specified below:

Hubert	5,058,834	Oct. 22, 1991

The following rejection is before us for review.[2]

[2] A final rejection of claims 2 through 7 under 35 U.S.C. § 103 was withdrawn by the examiner, as noted on page 1 of the answer (Paper No. 12).

Claims 1, 8, and 9 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Hubert.

The full text of the examiner's rejection and response to the argument presented by appellant appears in the answer (Paper No. 12), while the complete statement of appellant’s argument can be found in the brief (Paper No. 10).

OPINION

In reaching our conclusion on the anticipation issue raised in this appeal, this panel of the board has carefully considered appellant’s specification and claims, the applied patent to Hubert, and the respective viewpoints of appellant and the examiner. As a consequence of our review, we make the determination which follows.

We reverse the rejection of appellant’s claims 1, 8, and 9 under 35 U.S.C. § 102(b).

This panel of the board understands the examiner's assessment of the Hubert patent relative to the claimed subject matter, as set forth in the answer. However, for reasons explained, infra, we are not in accord therewith.

At this point, we note that appellant seeks to adjust the rate of depletion of propellant from propellant tanks on a

spacecraft to maintain attitude during velocity change (specification, page 1). As stated by appellant (specification, pages 8 and 9)

> propellant is drawn preferentially from one of the propellant tanks, such as the propellant tank closer to the center of mass, to thereby tend to shift the center of mass toward the thrust axis in the case of CM offset, or in a direction to compensate for the unwanted torque in other cases. Referring to FIGURE 2, tank 210a would be pressurized to a higher pressure than tank 210b, so that propellant would be preferentially drawn from propellant tank 210a during firing of thruster 24, thereby shifting center of mass 220 to the right, toward thrust axis 26.

It is apparent to us from the underlying disclosure that appellant achieves center of mass shifting according to the present invention only when the thruster is firing, drawing propellant preferentially.

Independent claim 1 is drawn to a spacecraft comprising, inter alia, a three-axis stabilized body,[3] and control means coupled to an attitude sensing means and to propellant coupling means, for controlling the propellant coupling means in response to error signals from the attitude sensing means, only during operation of a first thruster, in a manner which preferentially feeds propellant from one of first and second tanks to the first thruster in a manner which tends to move the actual center of mass relative to an axis of thrust in a manner which tends to maintain the attitude of the spacecraft.

[3] The patent to Hubert (column 1, lines 20 through 28) describes the differences between spacecraft stabilization by three-axis stabilization using thrusters and by spin stabilization. These types of stabilization appear to us to be terms of art. It is noted that appellant's disclosed spacecraft uses attitude control thrusters 20 (20a through 20n of Fig. 1).

Independent claim 8 sets forth a method for imparting velocity to a spacecraft comprising, inter alia, the steps of firing a thruster, to thereby draw propellant from first and
second propellant tanks; and only during the firing of the thruster, controlling the flow of propellant from the tanks in a manner which tends to move the actual center of mass of the spacecraft relative to the thrust axis of the thruster.

Akin to the analysis in the brief (pages 3 through 6), our reading of the Hubert patent reveals to us that appellant's claimed spacecraft and method are not anticipated by this document. Unlike the presently claimed invention, the invention of the Hubert patent (Fig. 2) addresses a spacecraft with spin

stabilization and balance (attitude) control by transferring liquid fuel between containers (propellant tanks) in a direction tending to reduce spin imbalance (column 3, line 30, through column 4, line 2). It is noted that, as expressed by

Hubert (column 3, lines 56 through 62), "[i]f thruster 38 is not to be energized," valves are controlled whereupon liquid is transferred between containers.[4]

Based upon our above findings regarding the teaching of the Hubert patent, it is clear to us that this reference does not teach, only during operation of a first thruster, preferential feed of propellant from one of the first and second tanks to the first thruster in a manner which tends to move the actual center of mass relative to an axis of thrust in a manner which tends to maintain the attitude of the spacecraft (claim 1 on appeal) or only during the firing of a thruster, controlling the flow of propellant from tanks in a manner which tends to move the actual center of mass of a spacecraft relative to the thrust axis of the thruster (method claim 8 on appeal). It is for

[4] Both the examiner (answer, page 3) and appellant (brief, page 5) understand the system of the Hubert reference as operating so long as there is an imbalance of the spinning spacecraft, regardless of the operating state of the velocity change thruster.

these reasons that the rejection of claims 1, 8 and 9 cannot be sustained.

In summary, this panel of the board has reversed the rejection of claims 1, 8, and 9 under 35 U.S.C. § 102(b) as being anticipated by Hubert.

The decision of the examiner is reversed.

REVERSED

IRWIN CHARLES COHEN Administrative Patent Judge	)	
NEAL E. ABRAMS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JOHN P. McQUADE Administrative Patent Judge	)	

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